AMENDMENT TO THE CLAIMS

Please enter the following amendments to the claims:

1. (Canceled)
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36. (Original) A method of designing a customized orthodontic bracket for a patient with the aid of a computer, said bracket having a bracket bonding pad, wherein the computer stores or has access to a three-dimensional model of portions of teeth of the patient to which said bracket will be bonded and either stores, or has access to, a library of virtual bracket bodies, comprising the steps of:

determining an area of a tooth at which said bracket bonding pad is to be attached to said tooth;

determining a three-dimensional shape of a tooth-facing surface of said bracket bonding pad, wherein said three-dimensional shape conforms to the three-dimensional shape of said tooth;

determining the three-dimensional shape of a second, opposite surface of said bracket bonding pad;

obtaining a bracket body from said library; and

uniting said bracket body with said bracket bonding pad to form one virtual three-dimensional object representing a bracket.

37. (Original) The method of Claim 36, wherein said second, opposite surface has a three-dimensional shape corresponding to said tooth-facing surface of said bracket bonding pad.

38. (Original) The method of Claim 37, wherein said second, opposite surface is determined by creating a normal vector for a plurality of surface elements forming said tooth-facing surface and creating said second surface by shifting said surface elements in the direction of the normal vector by an offset amount equal to the thickness of said bonding pad.

39. (Original) The method of Claim 36, further comprising the step of modifying the virtual model of the bracket body and/or modifying the bracket bonding pad.

40. (Original) The method of Claim 39, wherein said modification comprises adding an auxiliary

feature to said bracket body.

41. (Original) The method of Claim 40, wherein said auxiliary feature comprises hooks.

42. (Original) The method of Claim 40, wherein said auxiliary feature comprises a bite plane.

43. (Original) The method of Claim 36, wherein said step of combining further comprises the step of viewing, with the aid of said computer, a plurality of virtual teeth and virtual bracket bonding pads attached to said teeth, and shifting the location of said bracket body relative to its respective bracket bonding pad and/or removing parts of the bracket body that interfere with adjacent brackets and/or teeth.

44. (Original) The method of Claim 36, further comprising the step of removing a portion of the virtual bracket body, said portion comprising a portion that would project into said tooth when said bracket body is combined with said bracket bonding pad.

45. (Canceled)

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50. (Canceled)

51. (Original) A method of designing and manufacturing a customized orthodontic bracket, comprising the steps of:

a) storing a digital representation of portions of the patient's dentition in a computer;

b) accessing a library of virtual three-dimensional bracket bodies in said computer;

c) determining the shape and configuration of a bracket bonding pad, said bracket bonding pad having a tooth-facing surface conforming substantially exactly to corresponding three-dimensional surfaces of a tooth;

d) combining a bracket body from said library of bracket bodies with said bracket bonding pad to thereby create an individual, customized orthodontic bracket;

e) exporting digital data representing said customized orthodontic bracket from said computer to a manufacturing system for manufacturing said customized orthodontic bracket; and

i) manufacturing said customized orthodontic bracket.

52. (Original) The method of Claim 51, wherein said manufacturing system comprises a rapid prototyping system manufacturing a representation of said bracket to be used as a positive pattern, and wherein said manufacturing step comprises casting said bracket.

53. (Original) The method of Claim 51, wherein said manufacturing step comprises fabricating said bracket using a laser sintering process.

54. (Original) The method of Claim 51, further comprising modifying the digital representation of the dentition on a computer into a desired finish position and wherein steps c) and d) are performed after said teeth are virtually moved to said desired finish position.

55. (Original) The method of Claim 51, further comprising the step of making a physical model of the teeth of the patient, manipulating the physical model to place the teeth into a desired occlusion, scanning the physical model of the teeth in the desired occlusion, and wherein said digital representation comprises a three-dimensional representation derived from said scanning.

56. (Original) The method of Claim 51, wherein said bracket bonding pad has a second opposite surface opposite from said tooth-facing surface, and wherein said tooth-facing surface and second opposite surface have a three-dimensional area extent corresponding substantially exactly to a corresponding three-dimensional surface of said tooth.

57. (Original) The method of Claim 51, further comprising the step of transporting information as to the three-dimensional location of said bracket and/or the slot of said bracket to a wire bending robot for bending a customized orthodontic archwire for said patient.

58. The method of claim 51, wherein said bracket base comprises a feature forming a slot for receiving an archwire, and wherein said slot is oriented approximately parallel to said bracket bonding pad in the location of where said feature is combined with said bracket bonding pad.

59. (Original) The method of Claim 51, wherein said bracket further comprises a U-shaped inlay in a slot for said bracket.

60. (Original) A set of brackets for a patient manufactured according to the method of Claim 51.

61. (Original) The method of Claim 51 wherein steps c) and d) are performed by a user using

computer software providing a user access to a 3-D virtual model of the patient's dentition.

62. (Original) A method of designing a customized bracket for an individual patient with a computer, comprising the steps of:

a) selecting a virtual bracket bonding pad for a tooth of said patient from a library of virtual bracket bonding pads;

b) selecting a virtual bracket body for said tooth from a library of virtual bracket bodies; and

c) uniting the virtual bracket bonding pad with the virtual bracket body.

63. (Original) The method of Claim 62, further comprising the step of uniting the virtual bracket boding pad and virtual bracket body with a virtual auxiliary bracket device to thereby form said bracket.

64. (Original) The method of Claim 62, further comprising the step of removing a portion of the virtual bracket body that would otherwise project into said tooth.

65. (Original) The method of Claim 62, further comprising the step of exporting digital data representing the said bracket after performing step c) to a machine operating a rapid prototyping process.

66. (Original) The method of Claim 62, wherein a user visually observes and controls the performing of step c) by operating 3D graphics software on said computer to thereby arrive at a customized configuration of said bracket bonding pad and said bracket body.

67. (Original) The method of Claim 62, wherein step a) further comprises determining the shape of said three-dimensional virtual bracket bonding pad such that said pad fits the three-dimensional shape of said tooth.

68. (Original) The method of Claim 67, and wherein said bracket bonding pad has an opposite surface that further conforms to the three-dimensional shape of said tooth.

69. (Original) The method of Claim 62, wherein said bracket body comprises a feature forming a slot for receiving an archwire and wherein said slot is oriented substantially parallel to said bracket bonding pad.

70. (Original) The method of Claim 62, wherein said step of uniting comprises the step of filling a gap in three-dimensional virtual space between said virtual bracket bonding pad and said virtual bracket body.

71. (Original) The method of Claim 62, wherein the step of uniting results in a bracket configuration in which a portion of said bracket body projects into space that would be occupied by said tooth, and wherein the method further comprises the step of removing said portion.

72. (Original) The method of Claim 62, wherein said step of uniting results in a bracket configuration in which said virtual bracket body and said virtual bracket bonding pad fit to each other without requiring removing a portion of said virtual bracket body.

73. (Canceled)

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